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# A Paradigm Shift in Indian Agricultural Policy and Food Security: Reducing the Rice–Wheat Hyphenation

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***ABSTRACT***

Today, India is known throughout the world as an agricultural country. The Green Revolution began in India in the 1960s, especially during the period 1965-1968, in which food grain production was greatly increased by using modern technology, high-yielding seeds (HYV), chemical fertilizers and irrigation, which led to a major leap in India towards food security. The father of the Green Revolution at the global level is Norman Borlaug, while Dr. M. S. Swaminathan is considered the father of the Green Revolution in India, who made India self-sufficient in food grains through the use of high-yielding seeds and modern technology. In Maharashtra, former Chief Minister Vasantrao Naik is considered the pioneer of the Green Revolution. The post-Green Revolution food system is structurally linked to the rice-wheat cropping system that provides caloric security but generates increasing environmental, economic and nutritional costs. This paper synthesizes recent empirical evidence and policy developments to suggest that meaningful improvements in India's long-term food security require a deliberate de-hyphenation of rice and wheat – that is, reducing policy, market, and institutional incentives that lock regions into the rice-wheat treadmill – and replacing them with diverse, climate-resilient cropping systems (cereals, oilseeds, coarse grains, horticulture, fodder, and integrated farming). We review the factors sustaining the rice-wheat complex (prices, procurement, irrigation, input subsidies), examine the agronomic and socio-economic constraints to diversification, analyze recent state and central initiatives, and propose a coherent policy package (market reforms, targeted incentives, public goods investments, risk management, and extension reforms) to accelerate the transition while protecting smallholder farmers' incomes and national food security.

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## INTRODUCTION

Since the 1970s, the rice-wheat cropping system (IGP) has been central to India's food security agenda following the Green Revolution. Its expansion has brought major benefits in terms of food availability and caloric intake. But this one-pattern is associated with multiple stresses such as groundwater depletion, soil health degradation, greenhouse gas emissions, increased pest and disease incidence, and reduced dietary diversity and crop yields in many regions. All of this has the effect of jeopardizing production stability and nutritional outcomes under future climate and resource constraints without strategic restructuring. A strategic shift away from a strict rice-wheat dominance – hereafter referred to as "combination reduction" – does not mean abandoning both crops but rather rebalancing crop portfolios regionally, aligning incentives with resource endowments, and increasing crop diversity that contributes to nutrient security, income resilience, and environmental sustainability.

## SIGNIFICANCE OF THE STUDY

Rice and wheat together account for a large share of India's IGP crop area and are central to public procurement and public distribution systems. Public procurement, minimum support price (MSP) signals and subsidized inputs have led to local concentration of these grains. These policies have protected food availability and historically stabilized farmers' incomes, but they have also created lock-in effects that discourage farmers from experimenting with alternative crops. Also, long-term monoculture and intensive cultivation in the rice-wheat zone have well-known environmental impacts: declining water tables (particularly in parts of Punjab and Haryana), loss of soil organic matter and nutrient balance, grass burning and increased susceptibility to air pollution and heat and erratic rainfall. Several regional studies have reported a steady decline in crop diversity indices and the continued dominance of rice and wheat in Punjab and neighboring states.

Food security is multi-dimensional: availability, access, consumption and sustainability. Overreliance on two staples secures calories but does not necessarily provide micronutrients or dietary diversity. Therefore, national policy should balance the adequacy of staple nutrients with broader nutritional goals by promoting crops that provide protein, micronutrients, and improve dietary diversity.

## OBJECTIVE OF STUDY

1. To analyze the environmental and economic impacts of rice-wheat dominant cropping systems in India.
2. To assess the potential benefits (agricultural, economic and nutritional) of crop diversification for sustainable food security.

3. To assess the existing policies that maintains rice-wheat monoculture and identify the gaps in promoting diversification.
4. To propose policy measures to facilitate the transition towards diversified and sustainable agricultural systems.

**REVIEW OF LITERATURE**

**Scholars (e.g., Pingali & Shah, 2001; Chand et al., 2017)** trace the dominance of the RWCS to the Green Revolution, which prioritized high-yielding varieties of rice and wheat supported by input subsidies, assured procurement, and minimum support prices (MSP). **(Gulati & Banerjee, 2015).** Literature identifies this system as a cornerstone of India's post-independence food self-sufficiency, effectively ending chronic shortages. However, it also created a "policy-hyphenated" system, where farmer choices became locked-in due to economic incentives rather than agro-ecological suitability A robust body of work documents the severe negative externalities of the RWCS. This includes: **Groundwater Depletion:** Research in Punjab, Haryana, and Western UP shows alarming rates of water table decline due to paddy transplantation **(Fishman et al., 2015). Soil Health Degradation:** Studies highlight micronutrient deficiencies, organic carbon loss, and soil salinity induced by repetitive cereal monoculture **(Jat et al., 2020). Air Pollution:** Stubble burning of rice residue, a widespread practice in the northwestern Indo-Gangetic Plains, is a well-documented source of seasonal air pollution **(Shyamsundar et al., 2019). Diminishing Returns:** Evidence points to plateauing yields and declining input efficiency, threatening long-term productivity **(Kumar et al., 2018).**

**RESEARCH METHODOLOGY: -**

The research scholar has prepared paper is a descriptive study in nature. The study has been carried out based on the collection of the relevant secondary data. Secondary data collection was based on various sources such as published books, articles published in different journals & newspapers, periodicals, conference paper, working paper and websites, etc.

**MEANING OF HYPHENATION: -**

"hyphenation" refers to the strategic and policy-driven coupling of two or more agricultural elements—typically crops, but also practices or systems—so that they are treated as an inseparable pair in government planning, market operations, and farmer decision-making.

Just as a hyphen physically connects two words to make them a single unit (like "rice-wheat"), agricultural hyphenation connects two distinct crops or activities, binding their fates together through a web of interconnected policies, subsidies, and institutional support. It's a conceptual linking that shapes the entire agricultural landscape.

## ANALYTICAL INTERPRETATION OF CROP WATER FOOTPRINT AND PROTEIN CONTENT

| Crop | Water Footprint (L/kg) | Relative Water Intensity |
|---|---|---|
| **Rice** | 2500–5000 | Very High |
| **Wheat** | 1500–2500 | High |
| **Maize** | 1000–1800 | Moderate |
| **Pearl Millet** | 800–1200 | Low |
| **Chickpea** | 3000–4000 | Very High |
| **Groundnut** | 1500–2000 | Moderate |

**By the Observations of above table, we could find out Rice is the most water-intensive crop**, requiring up to 5000 L/kg. This explains severe groundwater depletion in states like Punjab and Haryana under continuous rice cultivation.

**Pearl millet shows the lowest water requirement**, making it highly suitable for semi-arid and drought-prone regions.

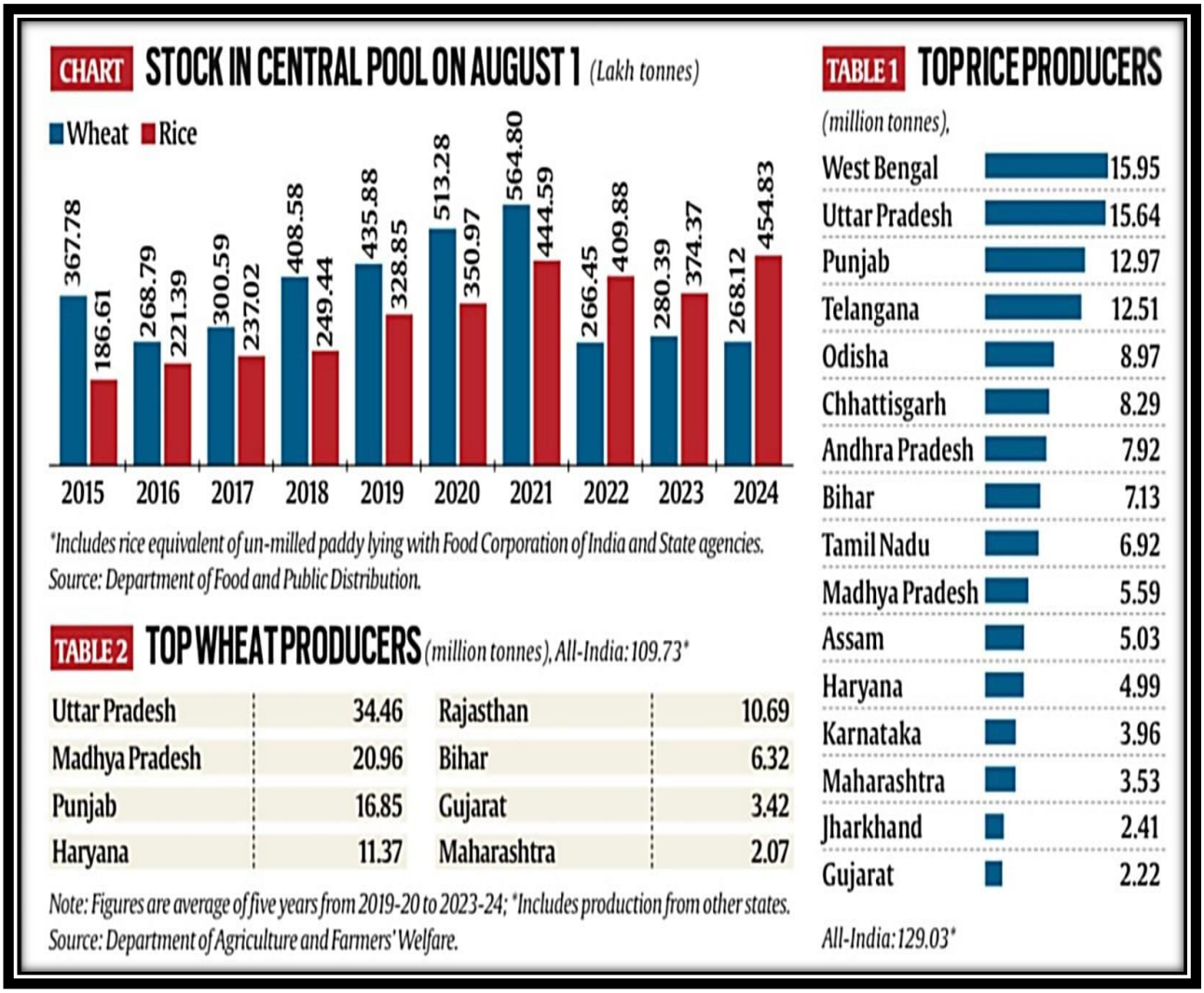
**Chickpea appears water-intensive**, though pulses often improve soil fertility through nitrogen fixation — so water footprint must be interpreted alongside ecosystem services.

**Maize and groundnut occupy a middle position**, offering potential alternatives to rice in water-stressed zones.

From a hydrological sustainability viewpoint, pearl millet and maize are superior substitutes for irrigated rice in vulnerable aquifers. water-intensive, nutrient-dense crops to achieve sustainable food security. The graph illustrates that rice has the highest water footprint per kilogram, while millets and pulses offer better protein content with significantly lower water requirements. This highlights the potential of diversifying toward

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## TOP RICE & WHEAT PRODUCER CHART:




By The above Indian express new paper chart as date on 3rd Spt.2024 Table 01 & Table 02, a clear divergence between rice and wheat stocks in India's central pool over the past decade. Until 2021, wheat stocks were generally higher than rice, but from 2022 onward rice stocks rose sharply, reaching the highest level in 2024, while wheat stocks declined and remained comparatively lower. The production tables also highlight structural differences. Rice cultivation is widely distributed across many states, with West Bengal, Uttar Pradesh, Punjab, and Telangana among the leading producers. In contrast, wheat production is more geographically concentrated, with Uttar Pradesh, Madhya Pradesh, Punjab, and Haryana accounting for a dominant share of total output. Overall, the images indicate that rice has a broader production base and stronger stock position, whereas wheat production and stocks are relatively more constrained.

India's food grain policy can no longer treat rice and wheat as a single "cereal surplus" problem. The data clearly show structural divergence.

Rice is in persistent surplus. Despite record exports in recent years, government stocks remain historically high. Production is geographically diversified, spans both kharif and rabi seasons, and responds strongly to irrigation and MSP incentives — as seen in Telangana. The policy risk here is stock accumulation, fiscal burden, and storage inefficiency. Export liberalisation appears economically rational.

Wheat, by contrast, is structurally tighter. It is geographically concentrated in a few northern states and limited to the rabi season. Production volatility is rising due to warming winters and terminal heat stress. Meanwhile, demand is expanding — particularly through processed foods based on maida produced by organised milling networks. This creates a classic supply-demand squeeze. Continued export restrictions have not rebuilt stocks meaningfully, indicating deeper production constraints.

Policy implication: rice requires market-clearing through exports; wheat requires productivity enhancement — higher yields, climate-resilient varieties, and possibly calibrated imports in deficit years. Treating both crops under a single diversification narrative obscures the real asymmetry.

In short: India faces a rice surplus management problem and a wheat supply security challenge — two fundamentally different policy questions.

**SUGGESTION & CONCLUSION**

First, I would like to say, Research scholar is social commentator & also Common man. In this research paper all views are personal; this article is not political or business policy as well as no covers any agenda. The research scholar main purpose is too aware the common people about the concept of Make in India & it positive as well as negative impact factor affecting on common people. Reducing the hyphenation of rice–wheat in India is a policy challenge that demands a deliberate paradigm shift rather than piecemeal tinkering. Well-designed mixes of procurement policy, infrastructure investment, irrigation governance and value-chain development can enable diversification without sacrificing national food security. Piloted, evidence-based action with robust monitoring is essential to test the central hypothesis. If successful, the shift will deliver environmental gains, enhance livelihoods and improve nutritional outcomes — delivering a sustainable win for India's next phase of agricultural development.

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